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Zidovudine + Lamivudine combination therapy vs Zidovudine monotherapy, to treat HIV infection. Based on probabilistic simulations, cumulative incremental net monetary benefits (CINMB) at a CE threshold of £20,000/QALY and probabilities of being cost-effective at various time-horizons (1-20 years) were estimated. Further, for each time-horizon, a CINMB frequency distribution was plotted and summary statistics were estimated. **RESULTS:** For the combination therapy, while the outcome uncertainty increased over time, the decision uncertainty decreased. 95% confidence interval for expected CINMB was narrowest at year 1 (-1,771£ to -1,755£) and widest at year 7 (2,101£ to 2,209£); simultaneously the probability of being cost effective increased from 5% to 80% during this time. Outcome uncertainty, measured as the standard deviation of CINMB values stabilized after 5 years while probability of the combination therapy being cost effective continued to increase, indicating that decision uncertainty does not vary in tandem with outcome uncertainty. **CONCLUSIONS:** The above analysis shows that higher outcome uncertainty does not necessarily lead to higher decision uncertainty. CINMB could be a useful tool to observe the relationships between outcome uncertainty, decision uncertainty and time.

PRM107

DEVELOPMENT OF A MODEL TO ASSESS THE COST-EFFECTIVENESS OF THERAPIES FOR PATIENTS WITH TYPE 2 DIABETES MELLITUS (T2DM) FOLLOWING A REFERENCE MODEL FRAMEWORK

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OBJECTIVES: To describe the practical approach implemented to construct a global cost-effectiveness model for T2DM therapies following a framework proposed for the development of reference models to inform public funding decisions. **METHODS:** 1) A systematic review of published models was conducted to conceptualise the model in terms of natural history and relevant effects to include. 2) Clinical and health economic experts were selected to provide feedback during the model conceptualisation (to identify the appropriate modelling technique), the model implementation and the assessment of the results. 3) The model was built and populated based on the systematic identification of best available data, a network meta-analyses, a review of previous T2DM submissions to health authorities and other published information. The model incorporated several structures for uncertain areas, such as: treatment patterns; type and timing of adverse events; their impact in the occurrence of long-term complications; and the impact of weight changes on relevant endpoints. 4) The model was then validated based on outputs' accuracy, feedback from country affiliates and consistency with the CORE model results. 5) The critical feedback received by HTA bodies has also been used to refine the model and improve its credibility accordingly. **RESULTS:** Experts' input proved invaluable at each developmental stage. One challenge related to the comparability with other published T2DM models, which were not fully transparent regarding assumptions. This framework resulted in a flexible model, accurate and stable, and easily adaptable to different health care systems. Country adaptations have contributed to the identification of aspects that require relevant structural changes and their rationale. **CONCLUSIONS:** The followed framework enhanced the transparency of the model and the accuracy of the results. Using a reference model across different countries, with adaptations made in consistency with this model, should help ensure consistent and comparable evaluations of the model across different countries.

PRM108

ASSESSING THE RELATIONSHIP BETWEEN INDIVIDUAL ATTRIBUTES IDENTIFIED IN REVIEW OF MULTI-CRITERIA DECISION ANALYSIS (MCDA) OF RARE DISEASES AND ANNUAL TREATMENT COSTS IN RARE ENDOCRINE DISORDERS

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OBJECTIVES: Payers have a perception that orphan products are extremely expensive. The current health technology assessment (HTA) systems might be too restrictive for orphan drugs, therefore potentially denying patients access to life-saving medicines. While price is important, it should be considered in relation to a broader range of product attributes, such as unmet need and disease severity that are not considered in cost-effectiveness analysis used by many HTA agencies. To overcome these challenges multi-criteria decision analysis (MCDA) has been proposed as an alternative to evaluate technologies. The aim of this study was to identify criteria reported in the literature, and to assess their impact on the total "score" for each product in relation to price. **METHODS:** A systematic literature review was conducted to identify the most frequently cited attributes in MCDA. From the leading attributes identified, we reviewed and plotted the relationship between single attributes and the average annual treatment costs for several drugs used in the treatment of endocrine-related rare diseases. Annual treatment cost was based on UK prices for the average daily dose per patient. **RESULTS:** The three most frequently mentioned attributes were 'disease severity', 'treatment impact on condition', and 'level of research undertaken to support use of the product'. Disease severity was not shown to influence product price. Similarly, orphan drugs are not necessarily more expensive than products without orphan drug status. There is little discernible relationship between treatment 'convenience' and average annual treatment cost. A trend was observed between the market size and the average annual treatment cost. **CONCLUSIONS:** If society is concerned about equity and equal access to medicines for all patients, MCDA may offer a viable alternative to inform in reimbursement decisions for orphan drugs. The analysis can be used to inform investigations on the application of MCDAs in rare diseases.

PRM109

VISUALIZING METHODS FOR DISCRETE-EVENT-SIMULATIONS USING THE EXAMPLE OF A BREAST CANCER DECISION-ANALYTIC MODEL

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OBJECTIVES: Discrete-Event-Simulation (DES) is a commonly used modeling tool to analyze the comparative effectiveness of alternative health technologies and to optimize resource allocation in health care settings. DES models are often rather complex and visualization is very important to improve transparency and acceptability. This study aims to illustrate and contrast alternative visualization techniques on a decision-analytic model for breast cancer. **METHODS:** DES visualization methods and their applications in health care, engineering, and operations research were sought from a wide variety of sources, including literature databases (e.g., PubMed) and webpages of simulation conference (e.g., Winter Simulation Conference), academic societies etc. Based on this review, alternative visualization techniques for the conceptual model were selected, applied on a real world modeling example and compared. **RESULTS:** In health care, the recently published ISPOR-SMDM Modeling Good Research Practice guidelines recommend flow diagrams or state charts to represent the key elements of a model, including the possible pathways, and the presence of queues and decision points. For flow charts, we found an international standard (ISO 5807). The application of standards like this could support harmonization of process-oriented models. In general, flow charts may lack the information of health states and transitions between health states that are relevant for clinicians to review the model. The semantic for state charts invented by Harel provides a further development of the bubble diagrams of State-Transition (Markov) Models (e.g. one state containing other states, one state detects changes in another). In state charts, health states could explicitly be named but treatment processes and resources use are less explicit. For DES software implementation, state charts seem to be less intuitive. For both methods, the application of visualization standards and guidelines was not always straight forward for our breast cancer model. **CONCLUSIONS:** In the case example there was no superior visualization technique.

PRM110

MICROSIMULATION MODEL FOR THE ASSESSMENT OF PERSONALIZED CANCER CARE: THE MAPCCA MODEL FRAMEWORK

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OBJECTIVES: Most cancer care models are based on observed clinical events such as recurrence-free and overall survival. Times at which events are recorded depend not only on effectiveness of treatment, but also on timing of examinations and types of tests performed. Should these change, observation times would change as well. Construct a microsimulation model that describes the cancer disease process using a description of underlying tumor growth as well as its interaction with diagnostics, treatments and surveillance. The aim is to arrive at a framework that allows for exploration of the impact of simultaneously altering two or more aspects of the care process. **METHODS:** The framework consists of two components; the *disease model* and the *clinical management module*. The *disease model* consists of a *tumor level*, describing the growth and metastasis of the tumor, and a *patient level*, describing clinical observed states, such as recurrence and death, either from the disease or other causes. The *clinical management module* consists of the care patients receive, i.e. the diagnostic process, treatment and surveillance. This module interacts with the disease process, influencing the rate of transitioning between tumor growth states at the tumor level, and the rate of detecting a recurrence at the patient level. **RESULTS:** A simulation study was performed to examine the feasibility of applying the framework to melanoma progression. Results demonstrated stage specific recurrence rates similar to those found in literature. **CONCLUSIONS:** The proposed microsimulation model framework allows for generating individual patient histories by simulating underlying tumor growth in interaction with clinical management. Our modeling approach allows for the exploration of the potential of drugs intervening in different parts of the tumor growth pathway. In addition, the approach allows for the evaluation of changing diagnostic patterns.

PRM111

METHODOLOGICAL EVALUATION OF THE IMPACT OF SURVIVAL COSTS IN ONCOLOGY MODELLING

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OBJECTIVES: Economic evaluations typically include all costs relevant to a disease, not only drug-related costs. This is particularly relevant to oncology modelling, as costs are assigned to each health state in the model, and, therefore, extending survival also increases costs. Because patients often incur higher health care costs in the post-progressed state of disease where costs of disease management are high, extending survival and increasing a patient's time in the post-progressed stage can be particularly costly. Empirical analyses of the implications of such methods have not yet been extensively investigated by assessing different scenarios such as baseline severity and prognosis. The objective of this research was to investigate the methodology used in oncology modelling, and to determine the effect that this has on predicted cost-effectiveness. **METHODS:** We developed a flexible three-state